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Department of Medical Technology

((General plant sciences))

1st stage

Lab (9)

Photosynthesis

By

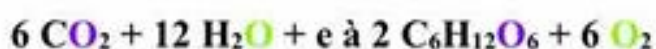
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Lab 9: photosynthesis

Demonstration of Release of Oxygen during Photosynthesis.

Photosynthesis is one of the most important anabolic chemical reactions that allow life to exist on Earth. With water, light energy from the sun, and carbon dioxide from the air, photosynthetic organisms are able to build simple sugars. Organisms that can make their own food are called autotrophs, and are at the base of the food chain. The basic reaction is:



carbon dioxide + water + light energy → glucose + oxygen

Photosynthesis: Is a process by which plants synthesize their own food in the presence of light. It takes place only in the green parts of the plant.

Requirements:

- 1- Few branches of an aquatic plant, i.e., Hydrilla, etc.
- 2-beaker
- 3- Glass funnel
- 4-test tube
- 5- Sodium bicarbonate, etc.

Expt.

The release of oxygen during photosynthetic process may be proved experimentally. A few branches of an aquatic plant, Hydrilla are kept in a big beaker full of the same pond water.



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Thereafter, the branches are covered with a glass funnel, and a test tube full of water is inverted at the end of the funnel as shown in the figure. If required, a small quantity of sodium bicarbonate may be added in the water, so that the supply of carbon dioxide may become adequate for the photosynthesis. Now, the apparatus is kept in the sunlight.

Observation:

The gas bubbles may be observed from the ends of the Hydrilla branches kept under the glass funnel in the beaker. These gas bubbles are accumulated in the end of the test tube inverted over the end of the funnel, and the water within the tube goes downward. On test the gas is to be proved oxygen.

Note:

To test the gas, the pyrogallol solution is taken in a beaker, and with the help of the thumb the tube partially filled with gas is kept inverted in the pyragallol solution. The solution enters the test tube and the tube again fills up completely because the pyragallol solution is soluble in oxygen.

Various modifications for this experiment:

- (1) When the pond water of beaker is replaced by boiled or distilled water.
- (2) When the above experiment is covered by a black cloth.
- (3) When the Hydrilla twigs are replaced by terrestrial plants.

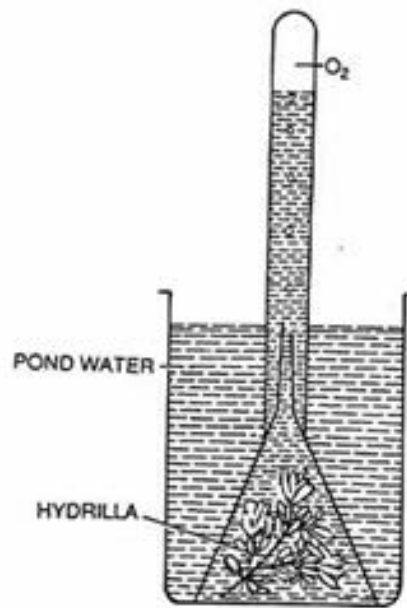


Fig. 5.22. Liberation of oxygen in photosynthesis.
Demonstration of the phenomenon.